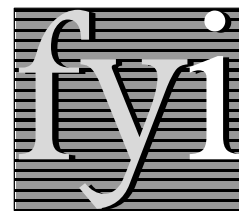


# using stormwater as a resource

# stormwater management



INFORMATIONAL  
SUPPLEMENT FOR  
DCLU CUSTOMERS

A look at alternative  
methods for flow and  
drainage control



**Illustration of Westlake Gardens, an element of the City's open space strategy which demonstrates sustainable design that integrates architecture and landscape to protect our urban watershed. Westlake Gardens is located along Westlake Avenue south of Denny Avenue.**

Illustration by Lorna Jordan Studio

The March 2003 issue of dcluINFO featured BuiltGreen™, the residential environmental building program supported by the City of Seattle. This month's feature explores a natural systems approach to stormwater management.

Recognizing that water is a defining element in our local ecosystem, the City of Seattle has several projects underway that celebrate water in the public realm. These endeavors are designed to reconnect our community to the natural water cycle and to use alternative methods of flow and drainage control to preserve our resources.

## Open Space Strategy Connects Two Watersheds

CityDesign, the urban design center within DCLU, is creating an open space strategy for the Center City called "The Blue Ring: Connecting Places." One of The Blue Ring's goals is to create an urban flow of people and water that responds to the Center City's two watersheds—Lake Union and Middle Puget Sound.

One project included in The Blue Ring is Westlake Gardens, which is located along Westlake Avenue south from Denny Avenue. Westlake Gardens will demonstrate stormwater strategies that integrate landscape and architecture to slow the flow and reveal water by using elements like eco-roofs; architectural downspouts, siding and cascades; cisterns; and streams, ponds, and wetlands.

## Civic Campus Will Save Over a Billion Gallons of Water Annually

Seattle's new Civic Campus open space design will evoke the flow of water from the sky to the Puget Sound. The water is captured on rooftops and directed "downstream" through the building sites. Public plazas will be enlivened as water is brought to the surface in ponds, fountains and public art. A portion of the Seattle Justice Center rooftop mimics a natural landscape with a vegetated roof system, or green roof, to reduce the overall flow

***"The City of Seattle has several projects underway that celebrate water in the public realm, using alternative methods of flow and drainage control."***

—Lynne Barker  
Sustainable Building Specialist, DCLU

See **stormwater management** on page 2

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**Seattle City Hall's stormwater collection system will save an estimated 987 million gallons of potable water each year, enough to supply 18 households.**

## stormwater management, cont. from page 1

of stormwater. Soil and plants capture and store rainwater, and the rooftop garden serves as an amenity for the building occupants and visitors.

Seattle's new City Hall will capture stormwater to meet non-potable water demand. The civil engineering firm worked with the project team to create an innovative solution to reduce the impact of stormwater on the municipal drainage system with the added benefit of reducing potable water demand for building operations. Stormwater will be stored in a cistern constructed from the basement of the old Municipal Building, and used for flushing toilets and irrigating the plaza landscape. (See item 1 on next page for additional details.)

### Stormwater Management Will Help Achieve LEED™ Status

Many of the stormwater management strategies demonstrated on the Civic Campus project will assist the projects in achieving LEED™ criteria. LEED stands for Leadership in Energy and Environmental Design and is a green building standard developed by the US Green Building Council. LEED establishes performance criteria for managing stormwater during construction and

through the life of a project, including:

- Controlling erosion to reduce negative impacts on water and air quality. All projects are required to meet best management practices developed by the EPA for managing stormwater during construction, or local codes, whichever is more stringent. Seattle Public Utilities recently completed a comparative analysis of the EPA's best management practices and Seattle's Stormwater, Grading, and Drainage Control Code. The measure-by-measure comparison indicates that Seattle's code is either more stringent or equivalent to EPA measures. This evaluation is available in the "LEED-related tools" section at [www.cityofseattle.net/sustainablebuilding/leeds](http://www.cityofseattle.net/sustainablebuilding/leeds).

- Limiting disruption of natural water flows by minimizing stormwater runoff, increasing on-site infiltration and reducing contaminants. This can be accomplished by infiltrating stormwater on-site where appropriate soil conditions exist, capturing stormwater for beneficial use, and treating stormwater to specified levels for removal of total suspended solids and total phosphorous.
- Limiting or eliminating the use of potable water for landscape irrigation. This can be accomplished by using captured rainwater, or stormwater, to meet some or all of the irrigation requirements.
- Reducing the generation of wastewater and potable water demand, while increasing local aquifer recharge. Stormwater can be captured and used to convey sewage through the municipal system.



*"SEA Streets," located in Northwest Seattle, is a pilot alternative street design that promotes creek restoration by reducing stormwater leaving the street. The design combines hydraulic engineering with soil science and botany to create a more natural system.*

See **stormwater management** on page 3



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***“Alternative flow control methods can extend public drainage system capacity, improve local water quality, and protect habitat.”***

—Ken Watanabe  
Site Development Supervisor, DCLU

## Additional Resources

For more information on Seattle’s Stormwater, Grading, and Drainage Control Code, visit DCLU’s Side Sewer Program website at [www.cityofseattle.net/dclu/sidesewer](http://www.cityofseattle.net/dclu/sidesewer), or contact the Side Sewer Counter, located on the 20th floor of Key Tower at 700 Fifth Avenue, in downtown Seattle, (206) 684-5362.

To learn more about natural drainage, including “SEA Streets,” visit Seattle Public Utilities’ Natural Drainage website at [www.cityofseattle.net/util/naturalsystems](http://www.cityofseattle.net/util/naturalsystems).

To learn more about Seattle’s Sustainable Building Program, visit their website at [www.cityofseattle.net/sustainablebuilding](http://www.cityofseattle.net/sustainablebuilding).

And to explore DCLU’s role in sustainable building, visit [www.cityofseattle.net/dclu/sustainability](http://www.cityofseattle.net/dclu/sustainability) or contact:

**Lynne Barker, DCLU**  
(206) 684-0806  
[lynne.barker@seattle.gov](mailto:lynne.barker@seattle.gov)

## stormwater management, cont. from page 3

section of Terry Avenue with permeable surfaces, such as porous concrete – for a total surface area of 5.1 acres. The annual runoff from a 5.1 acre area could fill a one acre pond over 15 feet deep. Impervious surfaces reduction credits in DCLU’s 2000 Flow Control Technical Requirements Manual would apply to this approach.

While direct infiltration of large quantities of stormwater is not always possible or practical due to soil conditions and/or basements in some areas, porous pavements still offer many benefits in these areas for stormwater quality improvements and retention. In areas where clay soils or other restricting subsurface conditions exist, or concerns where basement/groundwater is an issue, the sub-base could be lined and directed to landscape areas.

**3. Watershed Level** — Seattle Public Utilities (SPU) has a number of demonstration projects underway that feature “natural drainage systems.” These systems are designed to reduce the flow of stormwater into local creeks to reduce erosion and improve the water quality. The natural drainage systems are drainage capital improvement projects located in the public right-of-way, or streets and sidewalks. The systems feature a combination of elements with multiple functions, including: infiltration and slowing the flow of stormwater; filtering and bioremediation of pollutants by soils and plants; reducing impervious surfaces and incorporating porous paving; and increasing vegetation and other pedestrian amenities.

SPU is partnering with the Seattle Housing Authority to integrate a natural drainage system into the High Point development project—a 129-acre, mixed-income housing redevelopment located in the Longfellow Creek Watershed in West Seattle.

The natural system design proposes to integrate 22,000 lineal feet of vegetated and grassy swales throughout the development within the planting strip of the right-of-way. These swales include sub-surface engineered soil to provide storage and infiltration. Each swale is designed to treat the runoff from the road and housing of the adjacent block. At a system scale, the natural systems combined with a pond at the north end of the site will provide water quality treatment for the six-month storm and attenuate the two-year storm to pre-developed pasture conditions to enhance the stream flows in Longfellow Creek. This distributed block-scale system provides much greater opportunity to cleanse, cool and infiltrate stormwater runoff than the traditional piped and centralized management approach.

## How to Pursue Alternative Stormwater Management Practices

If you are interested in pursuing alternative methods of stormwater management, be sure to contact DCLU’s Side Sewer Team early in your pre-design process. Side Sewer staff are located on the 20th floor of Key Tower at 700 Fifth Avenue in downtown Seattle, (206) 684-5362. Their web address is [www.cityofseattle.net/dclu/sidesewer](http://www.cityofseattle.net/dclu/sidesewer).

